AMENDMENTS TO THE CLAIMS

Claims 1-18. (Cancelled).

19. (Currently Amended) A device, comprising:

a substrate of a semiconductor material;

an array of sensing pixels fabricated over said substrate, each sensing pixel being responsive to input radiation to produce a pixel output representative of received radiation by said sensing pixel, wherein said sensing pixels are formed of multiple pixel layers and at least one of said multiple pixel layers comprises an electrically conductive in-pixel circuit element; and

an optical mask layer formed over said substrate in an optical path of the input radiation, said optical mask layer having a plurality of optical elements to modify a property of the input radiation prior to detection by said sensing pixels,

wherein said ~~at least one of said multiple pixel layers comprising an~~ electrically conductive in-pixel circuit element is formed over said optical mask layer.

20. (Previously Presented) The device as in claim 19, wherein said optical mask layer is formed over at least one layer of said multiple pixel layers.

21. (Previously Presented) The device as in claim 19, wherein said multiple pixels layers forming said sensing pixels are fabricated on said substrate, and wherein said optical mask layer is between said multiple pixel layers and said substrate.

22. (Previously Presented) The device as in claim 19, wherein multiple pixel layers forming said sensing pixels include a first set of contiguous multiple pixel layers and a second set of contiguous pixel layers fabricated on said substrate, and wherein said optical mask layer is formed between said first set and said second set.

23. (Previously Presented) The device as in claim 19, wherein each optical element focuses the input radiation to a corresponding sensing pixel underneath said each optical element.

24. (Previously Presented) The device as in claim 23, wherein said sensing pixels are formed of a first set of contiguous multiple pixel layers and a second set of contiguous pixel layers fabricated on said substrate, and wherein said optical mask layer is formed between said first set and said second set.

25. (Previously Presented) The device as in claim 19, wherein each optical element selectively separates one color in the input radiation from another different color in the input radiation.

26. (Previously Presented) The device as in claim 25, wherein said optical mask layer is between said multiple pixel layers and said substrate.

27. (Previously Presented) The device as in claim 25, wherein each optical element spatially covers only one sensing pixel.

28. (Previously Presented) The device as in claim 25, wherein each optical element covers at least two adjacent sensing pixels.

29. (Previously Presented) The device as in claim 19, wherein each sensing pixel is an active pixel which has in-pixel circuit elements to convert radiation-induced charge into a current or voltage.

30. (Previously Presented) The device as in claim 19, wherein each optical element spatially covers only one sensing pixel.

31. (Previously Presented) The device as in claim 19, wherein each optical element spatially covers at least two adjacent sensing pixels.

32. (Previously Presented) The device as in claim 19, wherein each optical element both focuses a beam and spectrally filters the same beam.

33. (Previously Presented) The device as in claim 19, wherein each optical element is optically absorptive.

34. (Previously Presented) The device as in claim 19, wherein each optical element is optically reflective.

35. (Previously Presented) The device as in claim 19, wherein each optical element is optically refractive or diffractive.

36. (Withdrawn/Amended) A device, comprising:

a substrate of a semiconductor material;

a plurality of pixel layers formed over said substrate and patterned to define an array of sensing pixels, each sensing pixel being responsive to input radiation to produce a pixel output representative of received radiation by said sensing pixel;

a first optical mask layer formed over said substrate in an optical path of the input radiation, said first optical mask layer having a plurality of optical elements to optically interact with the input radiation; and

a second optical mask layer formed between said first optical mask layer and said substrate, said second optical mask layer separated from said first optical mask layer by a set of contiguous pixel layers and having a plurality of optical elements to optically interact with the input radiation that passes through said first optical mask layer,

wherein said contiguous pixel layers separating the first and second optical mask layers comprise electrically conductive in-pixel circuit elements.

37. (Withdrawn) The device as in claim 36, wherein each optical element in said first and second optical mask layers focuses received radiation.

38. (Withdrawn) The device as in claim 36, wherein each optical element in said first optical mask layer focuses received radiation and each optical element in said second optical mask layer separates one color from another different color in the input radiation.

39. (Withdrawn) The device as in claim 36, wherein said second optical mask layer is formed between said pixel layers and said substrate, and said first optical mask layer is formed over said pixel layers.

40. (Withdrawn) The device as in claim 36, wherein each sensing pixel is an active pixel which has in-pixel circuit elements to convert radiation-induced charge into a current or voltage.

41. (Withdrawn/Amended) A device, comprising:

a substrate of a semiconductor material;

an array of sensing pixels fabricated over said substrate, each sensing pixel being responsive to input radiation to produce a pixel output representative of received radiation by said sensing pixel; and

an optical mask layer formed over said substrate in an optical path of the input radiation, said optical mask layer having a plurality of optical elements to modify a property of the input radiation prior to detection by said sensing pixels, wherein each optical element both focuses a beam and spectrally filters the same beam,

wherein said sensing pixels are formed of multiple pixel layers comprising electrically conductive in-pixel circuit elements and at least one of said pixel layers is formed over said optical mask layer.

42-45. (Cancelled).

46. (Withdrawn) The device as in claim 45, wherein each optical element spatially covers only one sensing pixel.

47. (Withdrawn/Amended) The device as in claim [[45]] 41, wherein each optical element spatially covers at least two adjacent sensing pixels.

48. (Withdrawn) The device as in claim 41, wherein said sensing pixels are formed of a first set of contiguous multiple pixel layers and a second set of contiguous pixel layers fabricated on said substrate, and wherein said optical mask layer is formed between said first set and said second set.

49. (Withdrawn) The device as in claim 41, wherein each sensing pixel is an active pixel which has in-pixel circuit elements to convert radiation-induced charge into a current or voltage.

50. (Withdrawn) The device as in claim 41, wherein each optical element spatially covers only one sensing pixel.

51. (Withdrawn) The device as in claim 41, wherein each optical element spatially covers at least two adjacent sensing pixels.

52. (Currently Amended) An imager, comprising:

a plurality of pixel cells configured to convert incident light into an electrical signal, each pixel cell comprising a plurality of pixel layers; and

an optical layer between two of said plurality of pixel layers, the two pixel layers each containing an electrically conductive in-pixel circuit element,

wherein said optical layer ~~is configured to modify the incident light prior to conversion by the pixel cells~~ comprises a plurality of optical elements, each configured to focus the incident light on a respective pixel cell.

53. (Cancelled).

54. (Currently Amended) The imager of claim [[53]] 52, wherein the optical layer comprises a plurality of optical elements, each configured to spectrally filter the incident light prior to conversation by the pixel cells.

55. (Previously Presented) The imager of claim 52, wherein the optical layer is further configured to separate the incident light into constituent colors.

56. (Previously Presented) The imager of claim 55, wherein the optical layer is further configured to focus each color of the incident light onto a respective pixel cell.

57-68. (Cancelled).